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THE CHILD'S
BOOK OF ARITHMETIC



PHILADELPHIA:
H. COWPERTHWAIT & CO.
BOSTON: SHEPARD, CLARK & BROWN.

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GIFT OF
GEORGE ARTHUR PLIMPTON

THE CHILD

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COLBURN'S SERIES. PART I.

° The Child's

BOOK OF ARITHMETIC:

DESIGNED FOR USE IN

PRIMARY SCHOOLS.

BY

DANA P. COLBURN,

PRINCIPAL OF THE RHODE ISLAND STATE NORMAL SCHOOL; AUTHOR OF "ARITHMETIC
AND ITS APPLICATIONS," "THE COMMON-SCHOOL ARITHMETIC," ETC.

PHILADELPHIA:
H. COWPERTHWAIT & CO.
1859.

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MADE IN THE U. S. A.

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GEORGE ARTHUR PLIMPTON

JANUARY 25, 1924

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PREFACE.

THIS book is designed to meet the wants of Primary Schools, and to develop a plan of instruction which shall be strictly elementary, inductive, and progressive. It begins with the number ONE, and after carefully illustrating that in the first lesson, introduces the number TWO in the second, the number THREE in the third, and in like manner a new number in each of the first twenty lessons.

Each number is first illustrated to the eye, then the methods of writing it are exhibited, then the additions by which it may be produced are given, then the reverse subtractions, and lastly, such problems as seem likely to interest children, while leading them to a practical application of the operations previously illustrated.

In the 22d and 23d lessons, numbers above twenty are for the first time introduced. The manner in which they are formed from ten, and the methods of writing them, are explained, but no other exercises upon them are given.

By a similar arrangement to that adopted in the lessons on Addition and Subtraction, Multiplication and Division

are presented in the 24th, 25th, 26th, and 27th lessons. These operations are so closely connected with each other that it must certainly be more philosophical to thus present them together, than to entirely dis sever them, as is usually done in works on primary arithmetic. What, for instance, are " $3 + 2 = 5$," " 3 from $5 = 2$," and " $5 = 3$ more than 2 ," but different forms of expressing the idea that 5 is made up of 3 and 2 ? Again, what are the questions, " $\text{How many are } 4 \text{ times } 3?$ " " $12 = \text{how many times } 3?$ " and " $12 = 4 \text{ times what number?}$ " but different forms of expressing the fact that 4 times 3 are 12 ?

The lessons from the 28th to the 32d, inclusive, illustrate the nature of fractions and of some of the more simple operations involving them, and are followed by tables of moneys, weights, and measures.

Such is an outline of the plan of this work. The materials for it have been drawn chiefly from the *First Steps in Numbers*, published in 1849 by George A. Walton, of Lawrence, Mass., and myself, and from the *First Book of Arithmetic*, prepared by me in 1856.

With these explanations the *Child's Book of Arithmetic* is commended to the favor of those interested in primary instruction.

BRISTOL, R. I., July 15, 1859.

TO THE TEACHER.

YOUNG children commencing the study of Arithmetic need much oral instruction. At first each number and each operation should be illustrated to the eye by familiar exercises, similar in character to those indicated in the following

ORAL LESSON.

The Teacher, taking a book, asks, "What have I in my hand?" *Ans.*—"A book." "How many books?" *Ans.*—"One book." "How many pencils do I show you?" *Ans.*—"One pencil." "How many chairs do I point at?" *Ans.*—"One chair." "How many desks?" *Ans.*—"One desk."

Let the pupils now point to one boy, to one girl, to one window, &c.

Make the figure 1 on the blackboard, and tell the class that it means *one*, as 1 dog, 1 book. Show them also the script figure, as *1 dog, 1 book.*

The questions of Lesson I. may now properly be asked, the pupil having his book open before him. This will prepare the way for the

SECOND ORAL LESSON.

"How many pencils have I in my right hand?"
1* (5)

Ans.—"One pencil." "How many in my left hand?" *Ans.*—"One pencil." "How many in both?" *Ans.*—"Two pencils." "How many pieces of chalk have I in my right hand?" *Ans.*—"One." "In my left?" *Ans.*—"One." "In both?" *Ans.*—"Two." "How many fingers do I hold up?" *Ans.*—"Two." Taking up one pen and then another, ask, "One pen and one pen are how many pens?" "If I lay down one pen, how many shall I have left?" Lay down one pen, and show the remaining one. Then ask, "How many more must I get to have two?" Taking two pens in the right hand and one in the left, ask, "How many pens have I in my right hand?" "How many in my left hand?" "How many more in my right hand than in my left?" "How many less in my left hand than in my right hand?" "If I should pass one from my right hand to my left hand, how many would there be in my right hand?" "How many would there be in my left?"

The transition from these exercises to those of Lesson II. will be very easy. In reciting the subsequent lessons the pupil may or may not read the questions and problems from the book, at the discretion of the teacher.

If each of the first four or five lessons of this book are thus introduced by familiar oral exercises, the pupil will not be likely to find any serious difficulty with those which follow.

THE
CHILD'S ARITHMETIC.

LESSON I.



One boy. 1 boy. *1 boy.*

One girl. 1 girl. *1 girl.*

One ball. 1 ball. *1 ball.*

One. 1. *1.* I.

1. How many pictures are there on this page?
2. How many boys do you see in the picture?
3. How many girls do you see in the picture?
4. How many balls do you see in the picture?
5. How many thumbs have you on your right hand?
6. How many thumbs have you on your left hand?

LESSON II.



Two boys. 2 boys. *2 boys.*

Two soap-bubbles. 2 soap-bubbles.

Two. 2. *2.* II.

The mark 2, or *2*, is called the *figure two*.

How many boys do you see in the picture?

How many soap-bubbles do you see in the picture?

A. TO THE TEACHER.—The following questions should first be asked by substituting concrete in place of the abstract numbers. Thus: "How many apples are 1 apple and 1 apple? 1 pear and how many pears are two pears?" &c. The pupils should be taught to make such changes for themselves. The work is not, however, completed till the abstract numbers and operations are mastered.

1. How many are 1 and 1?

2. 1 and how many are 2?

3. 1 from two leaves how many?
4. How many must be taken from 2 to leave 1?
5. How many more are 2 than 1?

B. 1. George blew 1 soap-bubble, and Joseph blew 1. How many did both blow?

SOLUTION.—If George blew one soap-bubble, and Joseph blew one, both blew one soap-bubble and one soap-bubble, which are two soap-bubbles.

NOTE.—If such full forms of solution are at first too difficult for the pupils, less complete ones may for a time be substituted. Thus, instead of the above, the answer may be, "Two, because one and one are two." The full forms should, however, be introduced as soon as practicable; for they will not only teach pupils how to trace the connection between the problems and the numerical operations, and thus how to reason, but they will also prepare the way for the solution of more complicated problems. Attention to them early in the course will save much labor, both to teacher and to pupil, in the more advanced parts of Arithmetic, and even in the higher departments of Mathematics.

2. George has 1 bowl, and William has 1. How many bowls do both the boys have?

3. There were two soap-bubbles in the air, but 1 of them burst. How many remained?

4. Sarah has 2 dolls, and Mary has 1. How many more has Sarah than Mary?

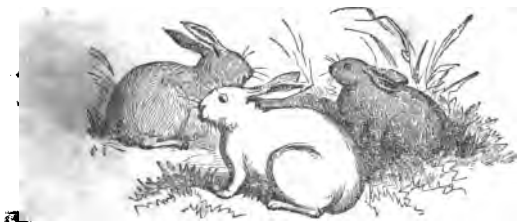
5. A STORY ABOUT JAMES.—James was a little boy who lived in the country, and studied the First Book of Arithmetic. On his way to school one day, he found 2 apples. At recess, he gave 1 of them to his Teacher, and ate 1; but just before recess was over, he received a present of 1 from a

schoolmate. After school, he found 1 under a tree, and gave 1 to a little boy whom he met. When he reached home, he roasted all he had left. How many did he roast?

NOTE.—Probably it will at first be desirable for the teacher to simplify such long problems as the one just given, by asking intermediate questions. For instance, after reading as far as “He gave one of them to his Teacher,” ask “How many did he have left?” “He ate one, how many did he have then?” &c. The pupil will soon learn to perform the problems without such aids.



LESSON III.



Three rabbits. 3 rabbits. *3 rabbits.*

Three. 3. *3.* III.

The mark 3, or *3*, is called the *figure three*.

- A. 1. How many are 2 and 1?
 2. How many are 1 and 2?
 3. *How many are 1 and 1 and 1?*

4. 2 and how many are 3 ?
5. 1 and how many are 3 ?
6. 2 from 3 leaves how many ?
7. 1 from 3 leaves how many ?
8. How many more are 3 than 2 ?
9. How many more are 3 than 1 ?

B. 1. Edward had 2 tame rabbits, and his cousin gave him 1 more. How many had he then ?

2. A cross dog afterwards killed 2 of Edward's rabbits. How many had he left ?

3. Emma had 3 rabbits, 1 of them was black, and the rest were white. How many were white ?

4. Lucy's father gave her 1 rabbit, her mother gave her 1, and her uncle gave her enough to make 3.

5. How many did her uncle give her ?

6. Henry's father gave him 2 cents, and his mother gave him 1, and then he spent 1 cent. How many cents did he have left ?

7. A STORY ABOUT CARRIE.—Carrie was a bright-eyed little girl who lived in a village. One day she cut out 2 paper dolls, and the next day she cut out 1 more. She then gave 1 to her playmate, Martha, and 1 to Maria. She afterwards cut out 2 more, but through carelessness, let 1 fall into the fire, when her mother cut out 1 very nice one, and gave it to her. How many had she then ?

TO THE TEACHER.—Make additional problems, and encourage the pupils to do it for themselves, arranging them somewhat in the form of stories, to increase their interest. Problems proposed by the pupil will usually be more interesting to a class than those proposed by a teacher or author.

LESSON IV.



Four reapers. 4 reapers. *4 reapers.*

Four. 4. *4.* IV.

The mark 4, or *4*, is called the *figure four*.

NOTE.—It should be made a part of the lesson for the pupil to write out the exercises in abstract numbers. He will thus learn to use figures and mathematical signs, and to write out arithmetical work neatly and correctly.

EXPLANATION.—A cross made thus, +, is sometimes used in place of “and” in such questions as, how many are 1 and 2? In like manner, “2 + 2 are 4” means the same as “2 and 2 are 4.” This sign is also called *plus*, and sometimes the *sign of addition*.

- | | | |
|--------------|---------------|---------------|
| A. 1. 3 + 1? | 3. 2 + 2? | 5. 1 + 1 + 2? |
| 2. 1 + 3? | 4. 1 + 2 + 1? | 6. 2 + 1 + 1? |

EXPLANATION.—Read and perform the following questions, and similar ones throughout the book, as though the words “*how many*” were put in the place of the star. Thus, the question “2 + * = 4?” means the same as “2 + how many = 4?”

- B. 1. $2 + * \text{ are } 4?$ 4. $1 + 1 + * \text{ are } 4?$
 2. $1 + * \text{ are } 4?$ 5. $1 + 2 + * \text{ are } 4?$
 3. $3 + * \text{ are } 4?$ 6. $2 + 1 + * \text{ are } 4?$

- C. 1. 1 from 4? 3. 3 from 4?
 2. 2 from 4? 4. 1 from 3?

D. How many more are—

1. 4 than 3? 3. 4 than 2?
 2. 4 than 1? 4. 3 than 1?

E. 1. George has 2 apples, and Rufus has 1. How many have both? How many more has George than Rufus?

 2. Edward had 2 marbles, and his father gave him a cent, with which he bought 2 more. How many had he then?

 3. Edward afterwards lost 1 marble, and gave away 2. How many had he left?

 4. Henry has money enough to buy an orange for 2 cents, an apple for 1 cent, and still have 1 cent left. How many cents has he?

 5. Jane had 1 picture-book, and on her birthday her father gave her 1 more, her mother gave her 1, and her uncle Henry sent her 1, which was very pretty. How many had she then?

 6. Susan cut 2 pictures out of one newspaper, and 2 out of another; she then gave 1 of the pictures to her little brother Henry, and 2 to her sister Fanny. After cutting out 3 more pictures, she sent what she had to her cousin Abby. How many pictures did she send to her cousin Abby?

LESSON V.



Five toy-horses. 5 toy-horses. *5* toy-horses.

Five. 5. *5*, V.

The mark 5, or *5*, is called the *figure five*.

- | | | |
|----------------|-----------------|-----------------|
| A. 1. $4 + 1?$ | 4. $2 + 3?$ | 7. $2 + 1 + 2?$ |
| 2. $1 + 4?$ | 5. $3 + 1 + 1?$ | 8. $1 + 1 + 3?$ |
| 3. $3 + 2?$ | 6. $1 + 2 + 2?$ | 9. $2 + 2 + 1?$ |

B. EXPLANATION.—Two parallel lines drawn thus, $=$, form what is called the *sign of equality*, which is often used in place of “are” in such cases as “ $2 + 2$ are 4,” which would then be written “ $2 + 2 = 4$.” This may be read “2 and 2 are 4,” or “2 plus 2 are 4,” or “2 plus 2 equal 4.”

- | | |
|-----------------|---------------------|
| 1. $2 + * = 5?$ | 4. $2 + 1 + * = 5?$ |
| 2. $1 + * = 5?$ | 5. $1 + 1 + * = 5?$ |
| 3. $2 + * = 5?$ | 6. $2 + 2 + * = 5?$ |

- | | |
|-----------------|--------------|
| C. 1. 2 from 5? | 3. 1 from 5? |
| 2. 4 from 5? | 4. 3 from 5? |

D. 1. Little Isaac had 5 toy-horses, but he gave away 2, and lost 1. How many did he have left?

2. How many sticks of candy, at 1 cent each, could you buy for a three-cent piece and 2 cents?

3. Arthur gave a half-dime for some nuts worth 2 cents, and some candy worth 1 cent. How many cents ought he to receive back?

4. Mr. French had 2 black horses, 2 white horses, and 1 gray horse. He sold his gray horse, and 1 of his black ones. How many had he left?

5. Lucy picked 3 quarts of blackberries in one pasture, and 1 quart in another, and then sold 2 quarts. How many quarts did she have left?

LESSON VI.



Six birds. 6 birds. *6 birds.*

Six. 6. *6.* VI.

The mark 6, or *6*, is called the figure six.

- A. 1. $5 + 1?$ 4. $2 + 4?$ 6. $2 + 2 + 2?$
 2. $1 + 5?$ 5. $8 + 3?$ 7. $1 + 3 + 2?$
 3. $4 + 2?$ 8. $1 + 2 + 3?$

- B. 1. $2 + * = 6?$ 4. $1 + 1 + 1 + * = 6?$
 2. $3 + * = 6?$ 5. $1 + 2 + * = 6?$
 3. $4 + * = 6?$ 6. $1 + 1 + 2 + * = 6?$

- C. 1. 4 from 6? 4. 3 from 6?
 2. 1 from 6? 5. 5 from 6?
 3. 2 from 6? 6. 6 from 6?

D. EXPLANATION.—“6 less 2” means 6 diminished by 2, or made smaller by 2, which is just the same as “2 from 6.” Hence, $6 \text{ less } 2 = 4$; $5 \text{ less } 3 = 2$, &c.

1. 6 less 2 3. 6 less 3? 5. 4 less 2?
 2. 5 less 3? 4. 5 less 1? 6. 6 less 4?

E. 1. Francis answered 2 questions in spelling, 1 question in reading, and 3 questions in arithmetic. How many questions did he answer in all?

2. Henry cannot tell me how many will be left if I take 2 from 6. Can you?

3. There were 6 boys at play; 3 of them were flying their kites, and the rest were rolling their hoops. How many were rolling their hoops?

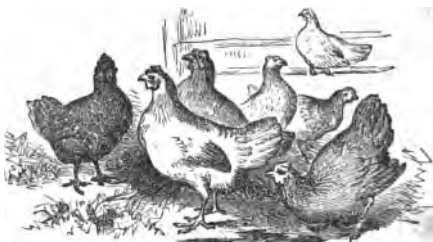
4. A pedlar had 6 plaster birds on a tray. 2 of them were painted yellow, 1 was painted red, and the rest were painted black. How many were painted black?

5. A hunter shot 1 partridge, 3 quails, and 2 pigeons. How many birds did he shoot in all?

6. Julia picked 3 white roses, and 3 red ones. How many roses did she pick in all? She gave 2

red roses and 1 white rose to her teacher, and 1 white rose to her friend Lydia. How many roses did she have then?

LESSON VII.



Seven hens. 7 hens. *7 hens.*

Seven. 7. *7.* VII.

The mark 7, or *7*, is called the *figure seven*.

- | | | |
|----------------|-------------|-----------------|
| A. 1. $6 + 1?$ | 4. $2 + 5?$ | 7. $3 + 2 + 2?$ |
| 2. $1 + 6?$ | 5. $3 + 4?$ | 8. $1 + 1 + 5?$ |
| 3. $5 + 2?$ | 6. $4 + 3?$ | 9. $2 + 1 + 4?$ |

- | | |
|---------------------|-------------------------|
| B. 1. $4 + * = 7?$ | 4. $2 + 1 + * = 7?$ |
| 2. $2 + * = 7?$ | 5. $1 + 2 + 1 + * = 7?$ |
| 3. $2 + 3 + * = 7?$ | 6. $2 + 2 + 2 + * = 7?$ |

- | | | |
|-----------------|--------------|--------------|
| C. 1. 6 from 7? | 3. 2 from 7? | 5. 1 from 7? |
| 2. 4 from 7? | 4. 3 from 7? | 6. 5 from 7? |
| 2 * | | |

D. 1. 7 less 3?

3. 7 less 2?

5. 7 less 5?

2. 7 less 1?

4. 7 less 6?

6. 7 less

1. Edward had 2 cents, but he afterwards found 5, and spent 3. How many did he have left?

2. If I should find 2 pears under one tree, 3 under another, and 1 under another, and then should eat 1 and give away 4, how many should I have left?

E. 3. A farmer had 7 gray hens, but he sold 2 of them, and a fox killed 1 of them. How many did he have left? He afterwards sold 2 more, and bought 4 small white hens. How many hens did he then have?

4. Alfred had a half-dime and 2 cents; but he exchanged the half-dime for its value in cents. How many cents did he then have? He was so unfortunate as to lose 3 of his cents, and he gave 3 more for a three-cent piece. How many cents did he then have?

5. 6 boys were at play together; 1 of them got hurt, and went home, and 2 were called away by their friends. How many remained?

6. Martin found 2 apples under one tree, 3 under another, and these with what he had at first made 7. How many did he have at first?

7. On counting up their games the boys found that they had played 2 games of "Ball," 2 of "Marbles," and enough of "Hide and Seek" to make up 7 games in all. How many games of "Hide and Seek" did they play?

LESSON VIII.



Eight persons. 8 persons. *8* persons.

Eight. 8 *8*. VIII.

The mark 8, or *8*, is called the *figure eight*.

- A. 1. $7 + 1?$ 4. $2 + 6?$ 6. $3 + 5?$
 2. $1 + 7?$ 5. $5 + 3?$ 7. $4 + 4?$
 3. $6 + 2?$ 8. $2 + 2 + 2 + 2?$

- B. 1. $2 + * = 8?$ 4. $3 + 2 + * = 8?$
 2. $4 + * = 8?$ 5. $1 + 1 + 2 + 1 + * = 8?$
 3. $3 + * = 8?$ 6. $1 + 2 + 3 + * = 8?$

- C. 1. 7 from 8? 4. 6 from 8?
 2. 2 from 8? 5. 3 from 8?
 3. 4 from 8? 6. 5 from 8?

D. How many more are—

1. 8 than 5? 4. 8 than 3?
 2. 8 than 1? 5. 8 than 2?
 3. 8 than 6? 6. 8 than 4?

E. EXPLANATION.—A single mark made like a dash, thus, —, is often used in place of the word "less." For instance: " $8 - 3 = 5$ " means the same as " 8 less $3 = 5$."

1. $8 - 3?$

3. $8 - 5?$

5. $8 - 6?$

2. $8 - 7?$

4. $8 - 2?$

6. $8 - 4?$

F. 1. In a ferry-boat were 4 ferrymen, 2 ladies, and 2 gentlemen. How many persons were in the boat?

2. A farmer had 8 little pigs. He sold 2 to one man, and 2 to another. How many had he left?

3. Sarah's mother gave her 3 dresses for her doll, her sister Susan gave her 2, and her aunt Mary gave her enough to make up 8. How many did her aunt Mary give her?

4. Ida thinks that if she should have 8 peaches, and should give 2 of them to her father, 2 to her mother, and 1 to her little sister, and then should receive a present of 3 from her uncle, she could give 2 to her brother, and still have 5 left. What do you think about it?

5. Alfred found 3 chestnuts under one tree, 4 under another, and 1 under another. He soon after ate 2, when, having the ill luck to fall, he lost 3. How many did he have left? He afterwards found 4 more, when, seeing a pretty squirrel run into a hole in a tree, he put in 3 chestnuts for the squirrel to eat. How many chestnuts had he left?

LESSON IX.



Nine ducklings. 9 ducklings. *9 ducklings.*

Nine.

9.

IX.

The mark 9, or *9*, is called the *figure nine*.

A. 1. $8 + 1?$

2. $1 + 8?$

3. $7 + 2?$

4. $2 + 7?$

5. $6 + 3?$

6. $3 + 6?$

7. $5 + 4?$

8. $4 + 5?$

9. $3 + 1 + 3?$

10. $2 + 2 + 5?$

11. $3 + 2 + 3?$

12. $1 + 2 + 4?$

B. 1. $5 + * = 9?$

2. $2 + * = 9?$

3. $4 + * = 9?$

$3 + * = 9?$

5. $2 + 5 + * = 9?$

6. $3 + 5 + * = 9?$

7. $3 + 3 + * = 9?$

8. $2 + 2 + 2 + * = 9?$

C. 1. 8 from 9?

2. 6 from 9?

3. 3 from 9?

4. 7 from 9?

5. 4 from 9?

6. 2 from 9?

- | | | |
|----|-----------|-------------|
| D. | 1. $9-5?$ | 4. $9-4-2?$ |
| | 2. $9-7?$ | 5. $9-2-3?$ |
| | 3. $9-6?$ | 6. $9-5-2?$ |

E. 1. A boy had 6 cents, and received a present of 2 more. How many did he then have? He spent 3 cents, and then had 4 cents given him, after which he spent 5 cents. How many cents did he have left?

2. Daniel had a red basket which held 3 quarts, a blue one which held 4 quarts, and a yellow one which held 2 quarts, and he picked berries enough to fill them all. How many quarts of berries did he pick?

3. Arthur says that he has cherries enough to give 3 to Robert, and 3 to Martha, and still have 3 left for himself. How many cherries has he?

4. Daniel cannot find the answer to the question how many are $3 + 2 + 4 - 5 - 3 + 1 + 3 + 3 - 6$? Can you tell him what it is?

5. How many more are $2 + 2 + 5 - 4$ than $8 - 3 - 2$?

6. Herbert's father gave him 3 books, his mother gave him 4, and his sister gave him enough to make up 9. How many did his sister give him?

7. Mr. Lee owned 6 cows, and Mr. Warren owned 2. How many did both own? Mr. Lee sold 3 cows to Mr. Warren. How many did each then own? How many did both? How many must Mr. Warren now sell to Mr. Lee in order that one may have as many as the other?

LESSON X.



Ten herrings. 10 herrings. *10 herrings.*

Ten. 10. *10.* X.

The mark 0 is called the *figure naught*, or *zero*.

A. 1. $9 + 1?$

2. $1 + 9?$

3. $8 + 2?$

4. $2 + 8?$

5. $7 + 3?$

6. $3 + 7?$

7. $6 + 4?$

8. $4 + 6?$

9. $5 + 5?$

10. $4 + 3 + 2?$

11. $2 + 3 + 5?$

12. $1 + 2 + 2 + 2 + 2?$

13. $2 + 2 + 2 + 2 + 2?$

B. 1. $2 + * = 10?$

2. $3 + * = 10?$

3. $5 + * = 10?$

4. $4 + * = 10?$

5. $1 + 4 + 2 + * = 10?$

6. $3 + 1 + 2 + * = 10?$

7. $2 + 4 + 3 + * = 10?$

8. $4 + 1 + 2 + * = 10?$

C. How many more are—

1. 10 than 6?

4. 7 than 4?

2. 8 than 3?

5. 10 than 7?

3. 10 than 5?

6. 10 than 8?

D. 1. $10-8$?

5. $10-5+3$?

2. $10-7$?

6. $10-4-3+6$?

3. $10-6$?

7. $10-3+2-4$?

4. $10-3$?

8. $10-4-4+5$?

E. 1. A hunter shot 3 birds from one flock, 2 from another, and 5 from another. How many did he shoot in all?

2. Anna says she has 10 picture-books, of which her mother gave her 3, her teacher gave her 1, her aunt gave her 1, her uncle gave her 1, and her father gave her the rest. How many did her father give her?

3. Eustis bought an orange for 4 cents, and an apple for 2 cents, giving in payment a dime. How many cents ought he to receive back?

4. Edward had a half-dime, a three-cent piece, and 2 cents. How many cents were they worth? He bought an apple for 2 cents, an orange for 3 cents, some candy for 1 cent, and some raisins for 3 cents. How many cents had he left?

5. Albert and Timothy went a-fishing one day. Albert caught 3 perch, 2 pickerel, and 4 trout. Timothy caught 2 perch, 3 pickerel, 3 trout, and 2 eels. How many fish did Albert catch? How many did Timothy catch? How many more did Timothy catch than Albert?

LESSON XI.



Eleven arrows. 11 arrows. *11 arrows.*

Eleven. 11. *11.* XI.

A. 1. $10 + 1?$

2. $9 + 2?$

3. $2 + 9?$

4. $8 + 3?$

5. $3 + 8?$

6. $7 + 4?$

7. $4 + 7?$

8. $6 + 5?$

9. $5 + 6?$

10. $4 + 2 + 3?$

11. $2 + 5 + 4?$

12. $2 + 2 + 1 + 2 + 2 + 2?$

13. $1 + 2 + 2 + 2 + 1 + 2?$

14. $3 + 1 + 3 + 2 + 2?$

B. 1. $5 + * = 11?$

2. $2 + * = 11?$

3. $4 + * = 11?$

4. $2 + 2 + 5 + * = 11?$

5. $3 + 4 + * = 11?$

6. $3 + 3 + 3 + * = 11?$

C. 1. $* \text{ from } 11 = 5?$

2. $* \text{ from } 11 = 6?$

3. $* \text{ from } 11 = 7?$

4. $* \text{ from } 11 = 4?$

5. $* \text{ from } 11 = 8?$

6. $* \text{ from } 11 = 3?$

- | | |
|---------------|------------------|
| D. 1. $11-4?$ | 8. $11-3?$ |
| 2. $11-2?$ | 9. $11-10?$ |
| 3. $11-6?$ | 10. $5+4+2-6?$ |
| 4. $11-8?$ | 11. $1+2+4+4-3?$ |
| 5. $11-5?$ | 12. $2+5+3-8?$ |
| 6. $11-9?$ | 13. $3+1+5-3?$ |
| 7. $11-7?$ | 14. $7+4-3-3?$ |

E. 1. A person was shooting arrows at a target, and I observed that when he had shot 3 arrows, and placed another in his bow, there were 7 lying on the ground. How many were there in all?

2. William owned 3 arrows, George owned 2, and Rufus 5. How many did they all own? As they were playing with their bows and arrows, William lost 1 arrow, Rufus lost 1 and broke 1, and George found a very nice one, which some boy had lost. How many arrows had the boys then?

3. I bought an apple, giving in payment a dime, and receiving back a half-dime and a three-cent piece. What was the cost of the apple?

4. How many more are $5+4-2+4$ than $6+5-8+4$?

5. One beautiful afternoon in June, Emma and Hannah went out to gather wild flowers, and make bouquets. Emma made 4 bouquets, and Hannah made 5, when they put the rest of their flowers together, and made 2 very pretty bouquets. How many bouquets did they make in all? They gave 3 of the bouquets to Hannah's mother, and 1 to her sister, 3 to Emma's aunt, and 2 to her teacher, after which, Emma took 1, and Hannah took the rest. How many did Hannah take?

LESSON XII.



Twelve eggs. 12 eggs. *12 eggs.*

Twelve. 12. *12.* XII.

A. 1. $10 + 2?$

2. $2 + 10?$

3. $9 + 3?$

4. $3 + 9?$

5. $8 + 4?$

6. $4 + 8?$

7. $7 + 5?$

8. $5 + 7?$

9. $6 + 6?$

10. $3 + 3 + 3 + 3?$

11. $3 + 2 + 3 + 2?$

12. $1 + 4 + 3 + 3?$

13. $2 + 5 + 2 + 3?$

14. $4 + 2 + 2 + 4?$

B. 1. $4 + * = 12?$

2. $5 + * = 12?$

3. $3 + * = 12?$

4. $3 + 4 + 3 + * = 12?$

5. $2 + 1 + 4 + * = 12?$

6. $2 + 1 + 2 + * = 12?$

C. 1. 6 from 12?

2. 9 from 12?

3. 2 from 12?

4. 8 from 12?

5. 10 from 12?

6. 7 from 12?

D. 1. $12-4?$

2. $12-3?$

3. $12-7?$

4. $12-8?$

5. $12-10?$

6. $12-9?$

7. $12-3-4?$

8. $2+7+3-6?$

9. $12-5-2?$

10. $1+8+2-4?$

E. 1. Alfred found a hen's nest, containing a large number of eggs. He took out 3, and then took out 4 more, when he found that there were 5 left. How many were there in the nest at first?

2. Alice had 11 little chickens, but 2 of them died, 2 of them got lost, and a rat killed 3. How many then remained?

3. Benjamin earned a half-dime, and found a three-cent piece and 4 cents. He spent 8 cents for a top, after which he received a present of 8 cents. How much money had he then?

4. Annie had 7 pictures, but she gave away 3 and afterwards received a present of 6. How many pictures did she have then?

5. Emma had 5 pictures, and received a present of 7 more, but she afterwards lost 3, and then gave what she had left to Susan. How many did she give to Susan?

6. Reuben had 3 cents. He earned 4 more by doing an errand, 2 by holding a gentleman's horse, and 3 by carrying a letter to the post-office. How many cents did he then have? He gave 3 cents to his brother Herbert, 2 to his sister Sarah, 3 to his cousin Hattie, 2 to his playmate Waldo, and kept the rest. How many did he keep?

LESSON XIII.



Thirteen sheep. 13 sheep. *13 sheep.*

Thirteen. 13. *13.* XIII.

A. 1. $10 + 3?$

2. $3 + 10?$

3. $9 + 4?$

4. $4 + 9?$

5. $8 + 5?$

6. $5 + 8?$

7. $7 + 6?$

8. $6 + 7?$

9. $2 + 3 + 4 + 3?$

10. $1 + 4 + 2 + 6?$

11. $4 + 3 + 3 + 2?$

12. $1 + 5 + 3 + 4?$

B. 1. $3 + * = 13?$

2. $5 + * = 13?$

3. $6 + * = 13?$

4. $3 + 4 + * = 13?$

5. $4 + 2 + 4 + * = 13?$

6. $2 + 3 + 4 + * = 13?$

C. 1. 9 from 13?

2. 7 from 13?

3. 4 from 13?

3 *

4. 6 from 13?

5. 5 from 13?

6. 8 from 13?

D. 1. $13 - * = 7?$

2. $13 - * = 4?$

3. $13 - * = 8?$

4. $13 - * = 9?$

5. $13 - * = 6?$

6. $13 - * = 5?$

E. 1. Mr. Green owns 13 sheep, and Mr. Allen owns 7. How many more does Mr. Green own than Mr. Allen? If Mr. Green should sell 4 sheep to Mr. Allen, how many would each have?

2. A farmer had 3 sheep in one pasture, 5 in another, and 4 in another. How many did he have in all?

3. A farmer who had 13 sheep, drove 6 of them into one pasture, 2 into another, and the rest into another? How many did he drive into the last pasture?

4. John says that he has money enough to buy an orange for 3 cents, an apple for 2 cents, some candy for 2 cents, some nuts for 3 cents, and still have 3 cents left to give you if you will tell him how many cents he has. What will you tell him?

5. Is there any little girl or boy in this class who can answer so hard a question as "How many are $3 + 4 + 5 - 6 - 4 + 8 + 3 - 7 - 6 + 5 + 4 + 3$?"

6. A little boy had 13 marbles. He lost 4, and gave away 3, when, finding that it was school-time, he put the rest into a box. How many did he put in the box? When he came from school, his father gave him 6 marbles which he put into the box with the others. How many marbles had he then?

LESSON XIV.



Fourteen barrels. 14 barrels. *14 barrels.*

Fourteen. 14. *14.* XIV.

A. 1. $10 + 4?$

2. $4 + 10?$

3. $9 + 5?$

4. $5 + 9?$

5. $8 + 6?$

6. $6 + 8?$

7. $7 + 7?$

8. $2 + 1 + 7 + 4?$

9. $4 + 2 + 8?$

10. $3 + 4 + 2 + 4?$

B. 1. $7 + * = 14?$

2. $5 + * = 14?$

3. $6 + * = 14?$

4. $3 + 4 + * = 14?$

5. $4 + 6 + * = 14?$

6. $2 + 4 + 3 + * = 14?$

C. 1. 9 from 14?

2. 6 from 14?

3. 4 from 14?

4. 8 from 14?

5. 7 from 14?

6. 5 from 14?

D. 1. $14 - 4 - 3?$

2. $14 - 6 + 3?$

3. $14 - 7 + 5?$

4. $4 + 5 + 5 - 6 + 3?$

5. $8 + 2 + 3 - 5 - 3?$

6. $3 + 2 + 4 + 5 - 6 - 3?$

E. 1. A truckman had a load of 14 barrels. He unloaded 6 at the store of Shaw & Co., 3 at a railroad depot, and the rest at the store of Saunders & Brown. How many did he unload at the last place?

2. Not long after, the same truckman had a load of 13 barrels, and he unloaded 4 of them at one place, and 3 at another, after which he took on his truck 8 barrels more. How many had he then on his load?

3. Susan says that she has 6 books without pictures, and 7 books with pictures. How many books has she in all?

4. Austin has 14 books. Waldo had 6, but his mother gave him 3 more, and his father gave him enough to make as many as Austin. How many did his father give him?

5. One day, Henry went out to look for chestnuts. He found 6 under one tree, 3 under another, and 5 under another. How many did he find in all?

6. Nathan found 13 chestnuts, and after eating 8 of them, and finding 6 more, he went home, carrying his chestnuts with him. How many did he carry home?

7. Simon found 14 chestnuts. He gave 3 of them to his father, 3 to his mother, 3 to his little sister Lucy, 3 to his sister Myra, and the rest to his brother Francis. How many did he give to Francis?

LESSON XV.



Fifteen apples. 15 apples. *15 apples.*

Fifteen. 15. *15.* XV.

A. 1. $10 + 5?$ 3. $9 + 6?$ 5. $8 + 7?$
 2. $5 + 10?$ 4. $6 + 9?$ 6. $7 + 8?$

B. 1. 8 from 15? 4. 7 from 15?
 2. 6 from 15? 5. 5 from 15?
 3. 10 from 15? 6. 9 from 15?

C. 1. $15 - 7 + 3?$ 4. $8 + 2 + 5 - 7?$
 2. $15 - 6 + 4?$ 5. $4 + 8 + 8 - 6?$
 3. $15 - 9 - 5?$ 6. $2 + 7 + 5 - 8 + 3?$

D. 1. $15 - * = 7?$ 4. $15 - * = 5?$
 2. $15 - * = 6?$ 5. $15 - * = 8?$
 3. $15 - * = 9?$ 6. $14 - * = 10?$

E. 1. A woman who had 15 apples, gave 2 to Susan, and 2 to Fanny. How many did she have left?

2. Julia made 4 squares of blue patch-work, 3 squares of brown, and 8 squares of red. How many did she make in all?

3. Hattie hemmed 15 handkerchiefs. 5 of them were for her sister, 2 were for her brother, 3 for her father, and the rest for her mother. How many were for her mother?

4. Augusta received 4 merit-marks on Monday, 3 on Tuesday, 1 on Wednesday, 2 on Thursday, and 5 on Friday, and none on Saturday. How many did she receive during the week?



LESSON XVI.



Sixteen tents. 16 tents. *16 tents.*

Sixteen. 16. *16.* XVI.

A. 1. $10 + 6?$ 3. $9 + 7?$ 5. $8 + 8?$
2. $6 + 10?$ 4. $7 + 9?$

B. 1. $8 + * = 16?$ 4. $3 + 4 + 2 + * = 16?$
2. $6 + * = 16?$ 5. $4 + 2 + 4 + * = 16?$
3. $2 + 5 + * = 16?$ 6. $1 + 3 + 2 + * = 16?$

C. 1. $16 - 6?$ 4. $16 - * = 7?$
2. $16 - 9?$ 5. $16 - * = 6?$
3. $16 - 7?$ 6. $16 - * = 8?$

D. 1. $14 = 4 + *?$ 6. $16 = 10 + *?$
2. $16 = 6 + *?$ 7. $13 = 10 + *?$
3. $13 = 3 + *?$ 8. $14 = 10 + *?$
4. $12 = 2 + *?$ 9. $12 = 10 + *?$
5. $11 = 1 + *?$ 10. $11 = 10 + *?$

E. 1. $4 + 2?$ 6. $1 + 4?$
2. $14 + 2?$ 7. $11 + 4?$
3. $4 + 12?$ 8. $1 + 14?$
4. $3 + 3?$ 9. $2 + 3?$
5. $13 + 3?$ 10. $12 + 3?$

F. 1. There were 4 tents in one row, 7 in another, 3 in another, and 2 in another. How many were there in all?

2. Albert was asked how many chestnuts he had, to which he replied, "If I should give my father 3, my mother 4, my little sister Anna 4, and my brother George 3, I should have but 2 left." How many chestnuts had he?

3. Lucy read 6 pages of history in the morning, and 10 in the afternoon, but when questioned

about it, she found that she had forgotten all but 4 pages. How many had she forgotten?

4. I had 3 dollars, and received 6 dollars of one man, 3 of another, and 2 of another, and then I paid away 8 dollars to one man, and 4 dollars to another. How many did I have left?

5. Which is worth the most, and how much the most,—a half-dime, a three-cent piece and 8 cents, or a dime, a three-cent piece and 2 cents?

LESSON XVII.



Seventeen birds. 17 birds. *17 birds.*

Seventeen. 17. *17.* XVII.

A. 1. $10 + 7?$

2. $7 + 10?$

3. $8 + 9?$

4. $9 + 8?$

5. $8 + 5 + 9?$

6. $6 + 2 + 8?$

- B. 1. $4 + 5 + * = 17?$ 3. $4 + 8 + * = 17?$
 2. $3 + 7 + * = 17?$ 4. $4 + 4 + * = 17?$

- C. 1. $* \text{ from } 17 = 8?$ 3. $* \text{ from } 17 = 7?$
 2. $* \text{ from } 17 = 10?$ 4. $* \text{ from } 17 = 9?$

- D. 1. $3 + 1 + 3?$ 4. $2 + 2 + 2?$
 2. $13 + 1 + 3?$ 5. $12 + 2 + 2?$
 3. $3 + 11 + 3?$ 6. $2 + 12 + 2?$

- E. 1. $4 + * = 7?$ 7. 3 from 7?
 2. $4 + * = 17?$ 8. 3 from 17?
 3. $14 + * = 17?$ 9. 13 from 17?
 4. $3 + * = 6?$ 10. 1 from 6?
 5. $3 + * = 16?$ 11. 1 from 16?
 6. $13 + * = 16?$ 12. 11 from 16?

F. 1. Jane gave 6 cents to a beggar-woman, Lucy gave 3, Sarah gave 5, and Abby gave 3. How many did all give her?

2. A poor woman who had 17 cents, spent 10 cents for bread, after which Julia gave her 4 cents, Nancy gave her 3 cents, and Susan gave her 2 cents. How many cents had she then?

3. A gardener picked 8 roses from one bush, 7 from another, and 2 from another. How many did he pick in all? He put 4 of the roses in one bouquet, 5 in another, and 3 in another, and the rest in another. How many did he put in the last bouquet?

4. Samuel bought a quart of molasses for 10 cents, and then had 6 cents left. How many cents had he at first?

5. Samuel made his molasses into candy, 9 sticks of which he sold for 7 cents, and the remaining 8 sticks he sold for 6 cents. How many sticks did he sell? How many cents did he receive for it?

LESSON XVIII.



Eighteen books. 18 books. *18 books.*

Eighteen. 18. *18.* XVIII.

A. 1. $10 + 8?$ 2. $8 + 9?$ 3. $9 + 9?$

B. 1. $8 + * = 18?$ 4. $2 + 2 + * = 14?$
 2. $9 + * = 18?$ 5. $12 + 2 + * = 14?$
 3. $10 + * = 18?$ 6. $2 + 12 + * = 14?$

C. 1. * from $7 = 3?$ 4. * from $8 = 4?$
 2. * from $17 = 8?$ 5. * from $18 = 4?$
 3. * from $17 = 13?$ 6. * from $18 = 14?$

D. 1. $8 - 2 - 2 - 2?$

2. $18 - 2 - 2 - 2?$

3. $18 - 12 - 2 - 2?$

4. $17 - 3 - 3 + 4?$

5. $9 + 6 + 3 - 4?$

6. $9 + 3 + 4 - 2?$

7. $10 + 3 + 4 - 3?$

8. $18 - 4 - 4 + 3 + 2?$

E. 1. One "Fourth of July," Robert's father gave him a dime, his mother gave him a half-dime, and his uncle gave him a three-cent piece; but he exchanged them for their value in cents. How many cents did he receive for them?

2. Henry had 18 cents. He paid 8 cents for a bunch of crackers, and 4 cents for torpedoes, and then gave the rest of his money to see some animals, which were exhibited in a tent. How many cents did he give to see the animals?

3. Mr. Gay owns a garden, a pasture, a wood-lot, and an orchard. His garden contains 3 acres, his pasture 6 acres, his wood-lot 4 acres, and his orchard enough to make up 18 acres. How many acres does his orchard contain?

4. Simon earned 6 cents by doing errands, 5 cents by holding a gentleman's horse, and 3 cents by delivering a letter. How many cents did he earn in all? How many more cents must he get to have enough to buy a slate for 12 cents, a pencil for 2 cents, and a sponge for 4 cents?

5. I had 17 dollars this morning, but I have since bought a hat for 4 dollars, and a pair of boots for 6 dollars. I have also received 11 dollars which a friend owed me, and paid a debt of 7 dollars. How much money have I now?

LESSON XIX.



Nineteen geese.

19 geese.

19 geese.

Nineteen.

19.

19.

XIX.

A. 1. $10 + 9?$

2. $9 + 10?$

3. $10 + * = 19?$

4. $9 + * = 19?$

5. $14 + 2 + * = 19?$

6. $4 + 2 + * = 19?$

7. $19 - 3 - 3?$

8. $19 - 3 - 13?$

B. How many more, are—

1. 9 than 2?

2. 19 than 2?

3. 19 than 12?

4. 8 than 3?

5. 18 than 3?

6. 18 than 13?

C. 1. $4 + 3 + 4 + 5?$

2. $8 + 3 + * = 19?$

3. $5 + 7 + 4 - 8?$

4. $8 + 5 + 6 - 7?$

5. $6 + 4 + 4 + 4?$

6. $4 + 6 + * = 19?$

7. $9 + 3 + 5 - * = 8?$

8. $10 + 4 + 4 - * = 11?$

9. $3 + 3 + 3 + 3 + 3 + 3?$

10. $1 + 3 + 3 + 3 + 3 + 3?$

D. 1. One day, Edward and Susan saw a flock of wild geese, which contained just 19. Some sportsmen shot 4 of them, which so frightened the rest, that 6 of them flew towards the east, and the remainder towards the west. How many flew towards the west?

2. Frank has money enough to buy a pencil for 3 cents, a pen for 6 cents, some ink for 4 cents, and an inkstand for 5 cents. How much money has he?

3. Frank's sister has money enough to buy a pen, and inkstand like Frank's, and 5 cents worth of paper. How many cents has she?

4. Walter and Reuben had each 12 cents, but Walter earned 5 cents by doing an errand, and Reuben spent 5 cents for confectionery. How many cents had each of the boys then? How many more had Walter than Reuben?

5. Carrie has hemmed 3 handkerchiefs for her father, 3 for her mother, 2 for her brother Charles, 4 for her "Uncle Isaac," and 4 for her "Uncle Dana." How many has she hemmed in all? How many less than her sister Lizzie, who has hemmed 19? How many more than her sister Emma, who has hemmed 12?

6. Martha cut out 6 paper dolls, Susan cut out 3 more than Martha, and Jane cut out 5 less than Susan. How many did Susan cut out? How many did Jane? How many did they all cut out?

7. How many more are $5 + 3 + 4 + 7 - 4 - 2$ than $18 - 3 - 7 - 5 + 4$?

LESSON XX.



Twenty soldiers. 20 soldiers. *20 soldiers.*

Twenty. 20. *20.* XX.

A. 1. $10 + 10?$

2. $10 + * = 20?$

3. $20 = * \text{ tens?}$

4. $20 - 10?$

B. 1. $3 + * = 10?$

2. $3 + * = 20?$

3. $13 + * = 20?$

4. $1 + * = 10?$

5. $1 + * = 20?$

6. $11 + * = 20?$

C. 1. $3 + 5 + 7 + 4?$

2. $2 + 9 + 4 + 5?$

3. $6 + 7 + 3 + 4?$

4. $2 + 1 + 4 + 8 + 4?$

5. $4 + 9 + 2 + 2 + 2?$

6. $2 + 4 + 4 + 4 + 4?$

7. $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2?$

8. $1 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2?$

9. $3 + 3 + 3 + 3 + 3 + 3?$

10. $1 + 3 + 3 + 3 + 3 + 3 + 3 + 3?$

4. Three idle boys, Thomas, Joseph, and Samuel, were disputing about their examples. Samuel said he performed 6 examples on Monday, 3 on Tuesday, and 5 on Wednesday. Joseph said he performed 3 on Monday, 5 on Tuesday, and 6 on Wednesday.

Thomas said he performed 6 on Monday, 3 on Tuesday, and 5 on Wednesday. Each thought he had performed more than either of the others; so they quarrelled about it. Now, can you tell who had done the most?

5. Ella found 6 peaches under one tree, 5 under another, 3 under another, and enough to make up 20 under another. How many did she find under the last tree?

6. Augusta found 8 peaches under one tree, and 11 under another, after which she ate 2, gave her sister Martha 3, and distributed the rest among her playmates. How many did she distribute among her playmates?

LESSON XXI.

ADDITION AND SUBTRACTION.

A. The question "How many are $6 + 9 + 7$?" requires us to add 6, 9, and 7 together, that is, to find how many units there are in 6, 9, and 7, taken together. All such questions are questions in *Addition*.

Addition is a process by which we find how many units there are in two or more numbers taken together.

The number thus found is called the **SUM** or

AMOUNT of the given numbers. Thus the sum of 6, 9, and 7 is 22, for $6 + 9 + 7 = 22$.

B. Add together or find the sum of 6, 8, and 3.

Ans. 6 plus 8 are fourteen, plus 3 are 17. Hence the sum of 6, 8, and 3 is 17.

Add together or find the sum of

- | | |
|--------------------|-----------------------------|
| 1. 5, 8, and 7. | 4. 2, 3, 4, 3, 2, and 1. |
| 2. 3, 7, 4, and 4. | 5. 6, 1, 5, 2, and 6. |
| 3. 2, 9, 3, and 5. | 6. 3, 2, 3, 5, 2, 2, and 2. |

C. Such questions as "How many are 4 from 9?" "How many more are 17 than 8?" &c., are questions in SUBTRACTION.

In the first, we are required to *subtract* 4 from 9, or to find how many units there are in the *difference* between 4 and 9, and in the second we are required to *subtract* 8 from 17, or to find how many units there are in the *excess* of 17 over 8. Hence

Subtraction is a process by which we find how many units there are in the difference between two numbers, or in the excess of one number over another.

- | | |
|---------------------------|-------------------------|
| D. 1. Subtract 8 from 12. | 4. Subtract 12 from 17. |
| 2. Subtract 9 from 13. | 5. Subtract 11 from 22. |
| 3. Subtract 5 from 20. | 6. Subtract 3 from 19. |

E. What is the difference between

- | | | |
|---------------|---------------|---------------|
| 1. 2 and 8? | 4. 4 and 17? | 7. 11 and 20? |
| 2. 6 and 13? | 5. 13 and 19? | 8. 8 and 20? |
| 3. 12 and 20? | 6. 7 and 20? | 9. 4 and 15? |

LESSON XXII.

2 tens = twenty, and is written 20, or *20*.

3 tens = thirty, and is written 30, or *30*.

4 tens = forty, and is written 40, or *40*.

5 tens = fifty, and is written 50, or *50*.

6 tens = sixty, and is written 60, or *60*.

7 tens = seventy, and is written 70, or *70*.

8 tens = eighty, and is written 80, or *80*.

9 tens = ninety, and is written 90, or *90*.

10 tens = one hundred, and is written 100, or *100*.

B. How many tens are there—

1. In 50?

4. In 70?

7. In 90?

2. In 80?

5. In 20?

8. In 40?

3. In 30?

6. In 60?

9. In 100?

C. What number is equal to each of the following:

1. 3 tens?

4. 4 tens?

7. 6 tens?

2. 9 tens?

5. 8 tens?

8. 2 tens?

3. 10 tens?

6. 7 tens?

9. 5 tens?

D. Write each of the following numbers in figures:

- | | | |
|------------|-------------|-----------------|
| 1. Forty. | 4. Ninety. | 7. Thirty. |
| 2. Eighty. | 5. Seventy. | 8. Sixty. |
| 3. Twenty. | 6. Fifty. | 9. One hundred. |



LESSON XXIII.

A. A unit is a single thing, or one.

$$2 \text{ tens} + 1 \text{ unit} = \text{twenty-one} = 21 = \text{21}.$$

$$2 \text{ tens} + 2 \text{ units} = \text{twenty-two} = 22 = \text{22}.$$

$$2 \text{ tens} + 9 \text{ units} = \text{twenty-nine} = 29 = \text{29}.$$

$$3 \text{ tens} + 1 \text{ unit} = \text{thirty-one} = 31 = \text{31}.$$

$$8 \text{ tens} + 7 \text{ units} = \text{eighty-seven} = 87 = \text{87}.$$

$$9 \text{ tens} + 9 \text{ units} = \text{ninety-nine} = 99 = \text{99}.$$

B. Count from *twenty* to *one hundred*, thus:—

Twenty-one, twenty-two, twenty-three, &c., &c.

How many are—

- | | | |
|--------------|--------------|--------------|
| 1. $20 + 8?$ | 3. $30 + 7?$ | 5. $60 + 9?$ |
| 2. $40 + 6?$ | 4. $90 + 3?$ | 6. $20 + 5?$ |

C. How many tens and units are there—

- | | | |
|-----------|-----------|-----------|
| 1. In 64? | 4. In 28? | 7. In 28? |
| 2. In 37? | 5. In 50? | 8. In 19? |
| 3. In 78? | 6. In 70? | 9. In 91? |

Write each of the following numbers in figures:

- | | | |
|------------------|------------------|-----------------|
| 1. Seventy-nine. | 4. Thirty-three. | 7. Fifty-three. |
| 2. Ninety-seven. | 5. Sixty-five. | 8. Thirty-five. |
| 3. Twenty-four. | 6. Fifty-six. | 9. One hundred. |

NOTE.—An Oral Lesson, like the following, will be a good introduction to Multiplication.

“If George should give me 2 apples, and then should give me 2 apples more, and then 2 more, how many times would he give me 2 apples?” “How many times 2 apples would he give me?” “How many apples?” “Then 3 times 2 apples are how many apples?” “How many then are 3 times 2?”

“If William should give me 3 apples, and then should give me 3 apples more, how many times would he give me 3 apples?” “How many times 3 apples would he give me?” “How many apples?” “How many then are 2 times 3?” “Which is the most, 3 times 2, or 2 times 3?”

LESSON XXIV.

- A. 2 times 1, or once 2 = 2 2 times 6, or 6 times 2 = 12
 2 times 2 = 4 2 times 7, or 7 times 2 = 14
 2 times 3, or 3 times 2 = 6 2 times 8, or 8 times 2 = 16
 2 times 4, or 4 times 2 = 8 2 times 9, or 9 times 2 = 18
 2 times 5, or 5 times 2 = 10 2 times 10, or 10 times 2 = 20

- B. 1. * times 7 = 14? 6. 4 = * times 2?
 2. * times 2 = 14? 7. 20 = * times 2?
 3. * times 4 = 8? 8. 16 = * times 2?
 4. * times 2 = 12? 9. 10 = * times 5?
 5. * times 2 = 18? 10. 6 = * times 2?

- C. 1. 4 times * = 8? 6. 16 = 2 times *?
 2. 2 times * = 8? 7. 4 = 2 times *?
 3. 2 times * = 10? 8. 20 = 10 times *?
 4. 3 times * = 6? 9. 12 = 2 times *?
 5. 2 times * = 14? 10. 18 = 9 times *?

- D. 1. 8 times 2, plus 4 = * times 10?

SOLUTION.—8 times 2 = 16; $16 + 4 = 20$; and $20 = 2$ times 10. Hence 8 times 2, $+ 4 = 2$ times 10.

2. 2 times 5, plus 8 = * times 2?
3. 7 times 2, minus 6 = * times 4?
4. 2 times 9, minus 6 = * times 2?
5. 2 times 4, plus 8 = * times 2?
6. 10 times 2, minus 6 = * times 7?

- E. 1. How much will 6 apples cost at 2 cents a-piece?

SOLUTION.—Since 1 apple costs 2 cents, 6 apples will cost 6 times 2 cents, which are 12 cents. Therefore, 6 apples at 2 cents each will cost 12 cents.

2. How much will 8 books cost at 2 dollars a-piece?

3. How much will 2 hats cost at 5 dollars a-piece?

4. How far will a man walk in 2 hours, if he walks at the rate of 4 miles per hour?

5. How many bushels will 8 boxes hold, if each box holds 2 bushels?

6. How many quarts of berries will George pick in 9 days, if he picks 2 quarts per day?

7. How much will 10 pairs of shoes cost at 2 dollars per pair?

8. If one plough costs 9 dollars, what will 2 ploughs cost?

9. If it takes Henry 2 days to earn a dollar, how many days will it take him to earn 10 dollars?

10. Susan has 8 picture-books, and Jane has twice as many as Susan. How many has Jane?

LESSON XXV.

1. How many apples at 2 cents each can be bought for 12 cents?

SOLUTION.—If one apple can be bought for 2 cents, as many apples can be bought for 12 cents as there are times 2 in 12, which are 6 times. Therefore, 6 apples at 2 cents each can be bought for 12 cents.

2. How many oranges at 3 cents each can be bought for 6 cents?

3. How many shawls at 7 dollars each can be bought for 14 dollars?

4. How many books at 2 dollars each can be bought for 20 dollars?

5. How many pencils at 2 cents each can be bought for 12 cents?

6. How many pictures at 9 cents each can be bought for 18 cents?

7. How many whips at 8 dimes each can be bought for 16 dimes?

8. George paid 18 cents for oranges at 2 cents each. How many oranges did he buy?

9. How many hours will it take a man to walk 14 miles, if it takes him 1 hour to walk 2 miles?

SOLUTION.—If it takes a man 1 hour to walk 2 miles, it will take him as many hours to walk 14 miles as there are times 2 in 14, which are 7 times. Therefore it will take a man 7 hours to walk 14 miles, if it takes him 1 hour to walk 2 miles.

10. How many days will it take a man to earn 10 dollars, if he earns 2 dollars per day?

11. How many pieces 8 feet in length can be cut from a piece of string 16 feet in length?

12. If a man can pick 2 quarts of berries in one hour, how many hours will it take him to pick 12 quarts?

13. How many boxes holding 2 bushels each, will be required to hold 20 bushels of apples?

LESSON XXVI.

A. 3 times 8 = 9 6 times 3, or 3 times 6 = 18
4 times 3, or 3 times 4 = 12 4 times 4 = 16
5 times 3, or 3 times 5 = 15 5 times 4, or 4 times 5 = 20

B. 1. * times 3 = 12? 5. 16 = * times 4?
2. * times 5 = 20? 6. 18 = * times 6?
3. * times 3 = 15? 7. 9 = * times 3?
4. * times 4 = 20? 8. 12 = * times 4?

C. 1. 4 times 3, plus 6 = * times 6?
2. 5 times 3, plus 1 = * times 4?
3. 4 times 5, minus 8 = * times 3?
4. 7 times 2, plus 4 = * times 2?
5. 3 times 3, plus 6 = * times 5?

D. 1. How much will 6 apples cost at 3 cents each?

2. George has enough money to buy 6 apples at 3 cents each, and still have 2 cents left. How much money has he?

3. Alfred bought 4 oranges at 4 cents each, and then had 3 cents left. How many cents had he at first?

4. Maria gave 5 pictures to each of her three companions, and still had 5 pictures left. How many did she have at first?

5. How many cents are equal in value to 4 three-cent pieces and 8 cents?

6. How many cents are equal in value to 3 half-dimes and 2 cents?

7. Henry worked 3 hours at 6 cents per hour, and then spent 5 cents. How many cents did he have left?

8. Horace bought 3 apples at 2 cents each, 4 oranges at 3 cents each, and some candy for 2 cents. How many cents did he spend in all?

9. If Abby has 19 apples, how many will she have left after giving her 4 sisters 4 apples each?

10. How many pen-holders at 3 cents each can be bought for 15 cents?

11. David had 20 cents. He gave 5 of them to his sister, and spent the rest for pencils at 5 cents each. How many pencils did he buy?

12. Simon had 4 three-cent pieces and 8 cents besides, but he exchanged them all for half-dimes. How many half-dimes did he obtain?

13. How many three-cent pieces are equal in value to a dime, a half-dime, and 3 cents?

14. Abner paid 15 cents for oranges at 3 cents each. How many did he buy? He ate one of them, and sold the rest at 4 cents each. How many cents did he receive for those which he sold?

15. How many boxes each holding 3 quarts can be filled from the berries in 9 boxes each holding 2 quarts?

16. A news-boy sold 4 papers at 3 cents each, 2 papers at 2 cents each, and 1 paper for 3 cents. How much did he receive for them?

17. A boy who had 19 cents, bought a writing-book for 7 cents, and gave the rest of his money for newspapers at 2 cents a-piece. How many papers did he buy?



LESSON XXVII.

A. 1. $14 =$ how many times 4?

ANSWER.—Fourteen equals 3 times 4 and 2 over, for 3 times 4 are 12, and $12 + 2 = 14$.

- | | |
|-----------------------|-----------------------|
| 2. $9 =$ * times 2? | 11. $11 =$ * times 4? |
| 3. $7 =$ * times 2? | 12. $18 =$ * times 7? |
| 4. $18 =$ * times 5? | 13. $5 =$ * times 3? |
| 5. $8 =$ * times 3? | 14. $19 =$ * times 6? |
| 6. $14 =$ * times 5? | 15. $15 =$ * times 7? |
| 7. $10 =$ * times 4? | 16. $20 =$ * times 7? |
| 8. $17 =$ * times 4? | 17. $16 =$ * times 6? |
| 9. $17 =$ * times 2? | 18. $16 =$ * times 5? |
| 10. $20 =$ * times 6? | 19. $12 =$ * times 5? |

B. 1. How many pictures at 3 cents each can be bought for 17 cents?

SOLUTION.—If one picture can be bought for 3 cents, as many pictures can be bought for 17 cents as there are times 3 in 17, which are 5 times and 2 over. Therefore 5 pictures at 3 cents each can be bought for 17 cents, and there will be 2 cents remaining.

2. How many toys at 4 cents each can be bought for 9 cents?

3. How many marbles at 2 cents each can be bought for 7 cents?

4. How many coats each containing 3 yards can be made from 14 yards of cloth?

5. How many bags each holding 3 bushels can be filled from 11 bushels of grain?

6. George has 15 cents. How many pencils at 4 cents each can he buy with his money?

7. How many cakes at 6 cents each can be bought for 4 three-cent pieces and a half-dime?

8. Arthur found 8 apples under one tree, 7 under another, and when he had found 5 under another he had enough to give 8 to each of his brothers, and still have a few left. How many brothers had he, and how many apples would he have left?

9. Jane had 20 cents. She bought as many pictures at 6 cents each as she could pay for, and then gave the rest of her money for apples at 2 cents each. How many pictures did she buy? How many apples?

ORAL EXERCISE ON FRACTIONS.

EXHIBIT any convenient thing, as an apple, to the class, and cutting it into two equal parts, ask, "What have I done to this apple?" *Ans.*—"You have cut it." "Into how many parts have I cut it?" *Ans.*—"Into two parts." "How do the parts compare in size?" *Ans.*—"They are equal." "Then how have I divided the apple?" *Ans.*—"You have divided it into two equal parts." "When anything is divided into two equal parts, the parts are called halves of the thing. What, then, will you call these parts of an apple?" *Ans.*—"Halves of an apple." "What will you call one part?" *Ans.*—"One half of an apple." "What will you call both parts?" *Ans.*—"Two halves of an apple." "What do both together equal?" *Ans.*—"A whole apple." "Then how many halves of an apple equal a whole one?" *Ans.*—"Two halves of an apple."

Continue and extend these illustrations by exercises similar in character to those suggested below:—

"How shall I divide this apple (showing another) into halves?" Dividing it, ask, "How many halves have I from it?" "How many halves did I have from the first apple?" "How many halves are there in all?" "Then two halves and two halves are how many halves?" "If I should give away one half, how many halves should I have left?" "Then one half from four halves leaves how many halves?"

Vary these exercises, dividing apples, strings, pieces of paper lines, &c., till the class understand fully the value of halves, thirds, &c., and see clearly that they can be added, subtracted, multiplied, and divided as whole numbers are. Such a course will save much hard labor afterwards, both to Teacher and Pupil.

LESSON XXVIII.



A. EXPLANATION.—Such parts as are obtained by dividing a thing into two equal parts are called halves of that thing.

1. What are the parts obtained by dividing an apple into 2 equal parts, called?

Ans.—Halves of the apple.

2. If I should divide an orange into 2 equal parts, what would one of the parts be called? What would 2 of them be called?

3. How many halves are there in the whole of anything?

4. Seth had a large apple, but he gave one half of it to his sister. What part of it did he have left?

5. Fanny's father gave her a half of a pound of raisins, and her mother gave her as many more. How many halves of a pound did both give her? How many pounds?

B. EXPLANATION.—Such parts as are obtained by dividing a thing into 3 equal parts, are called thirds of that thing.

1. Martha cut an orange into 3 equal parts. What ought she to call the parts? What should she call one of them? What should she call 2 of them? What should she call 3 of them?

2. David's mother gave him one third of a quart of chestnuts, and his father gave him two thirds of a quart. How many thirds of a quart did both give him? How many quarts?

3. Sarah had two thirds of a yard of ribbon, and she received a present of two thirds of a yard more. How many thirds of a yard did she then have? How many more thirds than there are in a yard?

C. EXPLANATION.—Such parts as are obtained by dividing a thing into 4 equal parts, are called fourths of that thing.

1. If you should divide a pear into 4 equal parts, what would you call the parts? What would you call 1 of the parts? What would you call 2 of them? 3 of them? 4 of them?

2. What part of an apple must the boy who has 3 fourths of an apple get, in order to have as much as a whole apple?

LESSON XXIX.

A. 1. What are halves?

Ans.—Halves are such parts as are obtained by dividing a unit into two equal parts.

- | | |
|----------------------|-----------------------|
| 2. What are thirds? | 5. What are ninths? |
| 3. What are fourths? | 6. What are tenths? |
| 4. What are fifths? | 7. What are twelfths? |

- B. 1. 2 books + 3 books = * books?
 2. 2 fourths + 3 fourths = * fourths?
 3. 2 tenths + 3 tenths = * tenths?
 4. 4 sevenths + 5 sevenths = * sevenths?
 5. 3 twelfths + 2 twelfths + 4 twelfths = * twelfths?
 6. 4 ninths from 7 ninths = * ninths?
 7. 3 fifths from 9 fifths = * fifths?
 8. 12 twentieths — 7 twentieths = * twentieths?
 9. 15 thirds — 7 thirds — 6 thirds = * thirds?
 10. 4 sixths + 9 sixths — 7 sixths = * sixths?

C. 1. If you should divide an apple into eighths, and give away 3 of the eighths, how many eighths would you have left?

2. William gave 2 sevenths of a watermelon to one boy, 3 sevenths of it to another, and 1 seventh of it to another. How many sevenths did he give away? How many did he have left?

3. Maria had a nice orange. She gave 3 ninths of it to her brother, 4 ninths of it to her sister, and kept the rest. How many ninths of it did she keep?

4. I bought a book for 3 tenths of a dollar, a slate for 2 tenths of a dollar, a pen for 1 tenth of a dollar, and then had 3 tenths of a dollar left. How many tenths of a dollar did I have at first?

5. Edward gathered 7 twelfths of a quart of walnuts, Joshua gathered 9 twelfths of a quart, and Martin gathered 3 twelfths of a quart. How many twelfths of a quart did they all gather?



LESSON XXX.

- A. 1. 4 times 3 apples = * apples?
2. 4 times 3 fourths = * fourths?
3. 4 times 3 tenths = * tenths?
4. 5 times 2 sevenths = * sevenths?
5. 6 times 3 fifths = * fifths?
6. 2 times 7 eighths = * eighths?

- B. 1. 4 apples equal how many halves of an apple?

SOLUTION.—Since 1 apple equals 2 halves of an apple, 4 apples must equal 4 times 2 halves of an apple, which are 8 halves of an apple.

2. 3 bushels equal how many halves of a bushel?
3. 5 pears equal how many halves of a pear?
4. 2 weeks equal how many sevenths of a week?
5. 6 melons equal how many thirds of a melon?
6. 5 peaches equal how many fourths of a peach?

- C. 1. 3 = how many fifths?

SOLUTION.—Since 1 equals 5 fifths, 3 must equal 3

times 5 fifths, which are 15 fifths. Therefore 3 equals 15 fifths.

2. 7 = * halves?

7. 4 = * fourths?

3. 4 = * thirds?

8. 7 = * thirds?

4. 5 = * fifths?

9. 2 = * eighths?

5. 3 = * sixths?

10. 3 = * fifths?

6. 5 = * halves?

11. 6 = * thirds?

D. 1. How much will 3 pencils cost, at 3 fifths of a dime each?

SOLUTION.—Since 1 pencil costs 3 fifths of a dime, 3 pencils will cost 3 times 3 fifths of a dime, which are 9 fifths of a dime. Therefore 3 pencils at 3 fifths of a dime each will cost 9 fifths of a dime.

2. How much will 6 pairs of shoes cost, at $\frac{3}{4}$ fourths of a dollar per pair?

3. How much will a boy earn in 7 days, if he earns 2 fifths of a dollar per day?

4. How much will 5 quarts of berries cost at $\frac{1}{8}$ eighths of a dollar per quart?

5. If one bag holds 6 sevenths of a bushel of corn, how much corn will 3 bags hold?

6. How many sixths of a dollar must be paid for 9 yards of muslin at 2 sixths of a dollar per yard?

7. Silas had 1 dollar, and he bought 4 books at $\frac{1}{6}$ twelfths of a dollar each. How many twelfths of a dollar did he pay for the books, and how many did he have left?

8. Herman has 1 dollar. How many eighths of a dollar will he have left, if he buys 2 books at $\frac{1}{4}$ eighths of a dollar each?

LESSON XXXI.

A. 1. 12 fourths of an orange equal how many oranges?

SOLUTION.—Since 4 fourths of an orange equal one orange, 12 fourths of an orange must equal as many oranges as there are times 4 in 12, which are 3 times. Hence 12 fourths of an orange equal 3 oranges.

2. 10 halves of an apple equal how many apples?
3. 15 thirds of a melon equal how many melons?
4. 20 fifths of a pear equal how many pears?
5. 18 thirds of an acre equal how many acres?

B. 1. 15 fifths equal how many ones?

SOLUTION.—Since 5 fifths equal one, 15 fifths must equal as many ones as there are times 5 in 15, which are 3 times. Hence 15 fifths equal 3 ones or 3

- | | |
|-------------------------|--------------------------|
| 2. 10 halves = * ones? | 7. 8 fourths = * ones? |
| 3. 9 thirds = * ones? | 8. 12 thirds = * ones? |
| 4. 18 ninths = * ones? | 9. 10 fifths = * ones? |
| 5. 20 fourths = * ones? | 10. 16 fourths = * ones? |
| 6. 14 halves = * ones? | 11. 15 thirds = * ones? |

C. 1. 14 fourths = * ones?

SOLUTION.—Since 4 fourths equal one, 14 fourths must equal as many ones as there are times 4 in 14, which are 3 times with 2 remainder. Hence 14 fourths equal 3 ones and 2 fourths, or 3 and 2 fourths.

- | | |
|-------------------------|----------------------------|
| 2. 9 halves = * ones? | 7. 16 fifths = * ones? |
| 3. 11 sixths = * ones? | 8. 20 ninths = * ones? |
| 4. 14 fifths = * ones? | 9. 17 sevenths = * ones? |
| 5. 20 eighths = * ones? | 10. 19 sixths = * ones? |
| 6. 17 thirds = * ones? | 11. 18 elevenths = * ones? |

- D. 1. 3 fifths + 8 fifths + 9 fifths = * ones?
2. 6 sevenths + 5 sevenths + 4 sevenths = * ones?
3. 8 tenths + 7 tenths + 5 tenths = * ones?
4. 18 fourths — 9 fourths + 7 fourths = * ones?
5. 9 times 2 sixths = * ones?
6. 5 times 4 tenths = * ones?
7. 6 times 3 eighths = * ones?
8. 4 times 4 sevenths = * ones?

E. 1. How many sixths of a dollar will 9 yards of cloth cost, at 2 sixths of a dollar per yard? How many dollars?

2. How many fourths of a yard of cloth will it take to make 6 vests, if it takes 3 fourths of a yard to make one vest? How many yards?

3. If John can earn 5 sixths of a dollar in one day, how many sixths of a dollar can he earn in 3 days? How many dollars?

4. If one basket holds 7 eighths of a peck, how many eighths of a peck will 2 baskets hold? How many pecks?

5. If George can hoe 3 fifths of a row of corn in 1 hour, how many fifths of a row can he hoe in 5 hours? How many rows?

6. It took me 8 ninths of an hour to learn my arithmetic lesson, 7 ninths of an hour to learn my geography, and 5 ninths of an hour to learn my grammar. How many ninths of an hour did it take me to learn them all? How many hours?

7. I bought 7 twelfths of an acre of land of one man, 4 twelfths of an acre of another, and 6 twelfths of an acre of another. How many twelfths of an acre did I buy in all? How many acres?

LESSON XXXII.

A. 1. If 12 apples should be divided into two equal parts, how many apples would there be in each part? What then is one half of 12 apples?

2. If 8 marbles should be divided into 4 equal parts, how many marbles would there be in each part? What then is one fourth of 8 marbles?

3. What number must be taken 2 times to equal 6? What then is one half of 6?

4. What number must be taken 4 times to equal 20? What then is one fourth of 20?

B. 1. What is one third of 18?

Ans.—One third of 18 is 6, because 3 times 6 equal 18.

2. What is one fifth of 10?

3. What is one fifth of 20?

4. What is one half of 14?

5. What is one third of 9?

6. What is one fourth of 12?

7. What is one sixth of 18?

8. What is one fourth of 16?

9. What is one ninth of 18?

10. What is one seventh of 14?

11. What is one tenth of 20?

C. 1. If 5 apples cost 10 cents, how many cents will 1 apple cost?

SOLUTION.—If 5 apples cost 10 cents, 1 apple will cost one fifth of 10 cents, which is 2 cents.

2. If 3 pencils cost 9 cents, what will 1 pencil cost?

3. If 9 caps are worth 18 dollars, how much is one cap worth?

4. If 18 marbles are divided equally among 6 boys, how many will each boy receive?

5. If 20 soldiers stand in 4 equal rows, how many will stand in each row?

6. If 15 figs can be bought for 5 cents, how many can be bought for one cent?

7. Arthur had 8 cents, and his father gave him 10 cents more, after which he divided his money equally among 3 poor persons. How many cents did he give to each?

8. Ellen had 12 pictures, but she gave away one third of them. How many did she give away? How many did she have left?

9. Daniel divided 15 apples equally among 3 girls, and 16 apples equally among 4 boys. How many did he give to each girl, and how many to each boy?

10. A man bought one third of a yard of cloth at 18 cents per yard, one fifth of a yard of ribbon at 20 cents per yard, and one fourth of a yard of calico at 20 cents per yard. What was the cost of the whole?

11. Ada's father gave her one half of 4 cents, her mother gave her one half of 12 cents, and her uncle gave her one third of 18 cents, and she thinks that no little boy or girl in this class can tell how many cents they all gave her. What do you think about it?

LESSON XXXIII.

ABOUT MONEY.

A. The people of the United States reckon money in dollars and cents.

TABLE OF UNITED STATES MONEY.

10 mills	= 1 cent.
10 cents	= 1 dime.
10 dimes	= 1 dollar.
10 dollars	= 1 eagle.

How many cents are equal in value—

To 2 dimes?	To 2 dimes and 5 cents?
To 3 dimes?	To 4 dimes and 8 cents?
To 5 dimes?	To 9 dimes and 4 cents?
To 9 dimes?	To 7 dimes and 6 cents?
To 1 dollar?	To 8 dimes and 2 cents?

B. The people of England do not reckon money in dollars and cents as we do, but in pounds, shillings, and pence.

TABLE OF ENGLISH MONEY.

4 farthings	= 1 penny.
12 pence	= 1 shilling.
20 shillings	= 1 pound.

NOTE.—An English penny is worth very nearly 2 cents; an English shilling is worth very nearly 25 cents; and an English pound almost 5 dollars.

LESSON XXXIV.

ABOUT WEIGHTS.

A. Sugar, Coffee, Tea, and almost all articles which are bought and sold by the pound, are weighed by Avoirdupois Weight.

TABLE OF AVOIRDUPOIS WEIGHT.

16 drams	= 1 ounce.
16 ounces	= 1 pound.
25 pounds	= 1 quarter.
4 quarters	= 1 hundred weight.
20 hundred weight	= 1 ton.

NOTE.—Every primary school ought to be supplied with the means of ascertaining the weight of anything which does not weigh more than 10 or 12 pounds. The teacher will find it a valuable exercise to let the pupils take different objects in their hands and judge of their weight, and afterwards test the accuracy of their estimate by actually weighing them.

B. Gold, Silver, and Precious Stones are weighed by Troy Weight.

TABLE OF TROY WEIGHT.

24 grains	= 1 pennyweight.
20 pennyweights	= 1 ounce.
12 ounces	= 1 pound.

NOTE.—A pound Troy weight is not quite as heavy as a pound Avoirdupois; but an ounce Troy is a little heavier than *an ounce Avoirdupois*.

C. In compounding and mixing medicines, physicians and apothecaries use Apothecaries Weight.

TABLE OF APOTHECARIES' WEIGHT.

20 grains = 1 scruple.

3 scruples = 1 dram.

8 drams = 1 ounce.

12 ounces = 1 pound.



LESSON XXXV.

HOW GRAIN AND LIQUIDS ARE MEASURED.

A. Grain, Nuts, Fruit, Salt, &c., are measured by Dry Measure.

TABLE OF DRY MEASURE.

4 gills = 1 pint.

2 pints = 1 quart.

8 quarts = 1 peck.

4 pecks = 1 bushel.

B. Most liquids, as water, spirits, and wine, are measured by Liquid Measure.

TABLE OF LIQUID MEASURE.

4 gills = 1 pint.

2 pints = 1 quart.

4 quarts = 1 gallon.

LESSON XXXVI.

ABOUT LENGTHS AND DISTANCES.

A. Distances are measured by Long Measure.

TABLE OF LONG MEASURE.

12 inches	= 1 foot.
3 feet	= 1 yard.
5 and one half yards	= 1 rod.
40 rods	= 1 furlong.
8 furlongs	= 1 mile.
3 miles	= 1 league.

This line _____ is just an inch long.

Mention something a foot long.

How many feet long do you think your teacher's desk is? How many feet high? How many feet long do you think this room is? How many feet wide? How many feet high?

NOTE TO THE TEACHER.—Extend such exercises as these, requiring the class to judge of the length of many familiar objects, and to make lines of a given length on their slates and on the blackboard. Of course, a foot rule or some other measure should be used to verify or correct their estimates.

B. Cloths, Silks, &c., are measured by Cloth Measure.

TABLE OF CLOTH MEASURE.

2 and one fourth inches	= 1 nail.
4 nails	= 1 quarter.
4 quarters	= 1 yard.

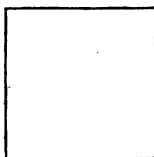
LESSON XXXVII.

ABOUT SURFACES AND SOLIDS.

A. Land and all surfaces are measured by Square Measure.

A square is a figure having four equal sides and four equal angles.

This figure is a square. The angles are at the corners.



NOTE.—The teacher should illustrate and explain the nature of surfaces, angles, and squares, and the use of this measure.

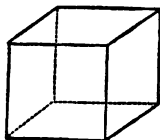
TABLE OF SQUARE MEASURE.

144 square inches	= 1 square foot.
9 square feet	= 1 square yard.
30 and one fourth square yards }	= 1 square rod.
40 square rods	= 1 rood.
4 roods	= 1 acre.
640 acres	= 1 square mile.

B. All solids, that is, all bodies which have length, breadth, and thickness, are measured by Cubic Measure.

TABLE OF CUBIC MEASURE.

1728 cubic inches	= 1 cubic foot.
27 cubic feet	= 1 cubic yard.
16 cubic feet	= 1 cord foot.
8 cord feet or 128 cubic feet }	= 1 cord of wood.



A cube is a solid whose length, breadth, and height are equal.

This figure represents a cube. Your teacher will show you a cubical block.

LESSON XXXVIII.

HOW TIME IS RECKONED.

A. Time is reckoned in hours, days, weeks, months, and years.

TABLE OF TIME.

60 seconds	= 1 minute.
60 minutes	= 1 hour.
24 hours	= 1 day.
7 days	= 1 week.
365 and one fourth days or 52 weeks and one and one fourth days	} = 1 year.
100 years	
	= 1 century.

B. The year is divided into 12 months.

TABLE OF MONTHS.

January has 31 days.	July has 31 days.
February has 28 days.	August has 31 days.
March has 31 days.	September has 30 days.
April has 30 days.	October has 31 days.
May has 31 days.	November has 30 days.
June has 30 days.	December has 31 days.

Every fourth year is called Leap Year, and then February has 29 days.



LESSON XXXIX.

OTHER WAYS OF RECKONING.

A. Things are sometimes reckoned by the dozen, by the gross, or by the score.

TABLE.

12 things = 1 dozen.

12 dozen = 1 gross.

12 gross = 1 great gross.

20 things = 1 score.

B. Paper is sold by the sheet, by the quire, or by the ream.

24 sheets of paper = 1 quire.

20 quires of paper = 1 ream.

C. Salt Beef, Salt Pork, and Flour are sold by the pound, or by the barrel.

A barrel of beef weighs 200 lbs.

A barrel of pork weighs 200 lbs.

A barrel of flour weighs 196 lbs.

D. 1. How many eggs are there in a dozen?

2. How many pigeons are there in a half-dozen?
3. How many cakes are there in a dozen and a half?
4. Rufus found 10 eggs in one nest and 8 in another. How many eggs did he find in all? How many dozen?
5. If a man's hens lay 3 eggs per day, how many days will it take them to lay a dozen?
6. How many sheets are there in a half-quire of paper?
7. How many quires of paper are there in a half-ream?
8. How many quires of paper are there in a quarter-ream?
9. Joseph bought a half quire of paper, and sold one third of what he bought. How many sheets did he sell?

THE END.







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